



INTERPRETATIONS & APPLICATIONS OF BUILDING CODES & REGULATIONS #98-7

CODE SECTION : IBC 307

02/10/98 rev 9/16/03

SUBJECT : REQUIREMENTS FOR GROUP H OCCUPANCIES

Section 307 serves as the focal point for requirements pertaining to construction of hazardous occupancies in the IBC, users of the code should be aware that there are many additional requirements pertaining to construction of hazardous occupancies in the IFC. It is essential that persons designing, reviewing and inspecting hazardous occupancies consult both codes to ensure that all applicable regulations are considered.

Major provisions such as fire-extinguishing system requirements and spill control, drainage control and secondary containment requirements were duplicated in both the codes for emphasis and convenience. Overall, there is an integral relationship between the IBC and IFC requirements for dealing with hazardous materials

There are two basic types of Group H Occupancies--those which are designated as Group H based on particular operations that are conducted and those which are designated as Group H based on excessive quantities of hazardous materials contained therein. Those occupancies which are designated as Group H based on their particular operations are Group H, Divisions 4, 5 and 6. Those occupancies which are designated as Group H based on excessive quantities of hazardous materials are Group H, Divisions 1, 2, 3 and 7.

Once the hazardous processes and materials have been identified, by outside technical assistance when needed, it is necessary to classify the materials based on the categories used by the IBC and IFC.

Classifying materials is a subjective science, requiring judgment decisions by an expert familiar with the characteristics of a particular material to categorize it within the categories used by the Uniform Codes. Accordingly, material classifications must be determined by qualified individuals, such as industrial hygienists, chemists or fire-protection engineers. MSDS's are not normally acceptable as a means of providing material classifications used by the IBC and IFC

It is not the responsibility of the jurisdiction to provide classifications for hazardous materials. Rather, it is the responsibility of the permit applicant to provide material classification information to jurisdictions. IFC Chapter 27 is merely intended for general guidance and examples. This appendix should not be cited as a sole basis for classifying materials. The listings are partial and often do not address all of the hazards of a given material. When hazardous materials possess the characteristics of more than one hazard category, which is most often the case, all applicable hazard categories must be evaluated with respect to the code requirements.

In the classification system used by the International Codes, hazardous materials are generally divided into two major categories, physical and health hazards, and subcategories as defined in the International Fire Code in Chapter 27. Ten pounds of material classified as both an oxidizer and a corrosive must be considered as both 10 pounds in the oxidizer category and 10 pounds in the corrosive category.

Exempt amount. For interior storage and use, the first step in applying the UBC is to classify the occupancy. Occupancy classification of buildings containing hazardous materials is based on the

"exempt amount" concept. Exempt amounts are the maximum quantities of hazardous materials that may be stored or used in an area before the area must be designated as a Group H Occupancy. The term "exempt" refers to quantities which are exempt From Group H Occupancy requirements, and it is not intended to imply an exemption from all code requirements. Exempt amounts vary for different states of materials (solid, liquid or gas) and for different situations (storage or use). Exempt amounts are also varied based on protection which is provided such as fire-extinguishing systems and storage cabinets.

Control areas. Areas in a building which are designated to contain less than or equal to the exempt amounts of hazardous materials and which are properly separated from other areas containing hazardous materials are called "control areas." Any combination of hazardous materials, up to the exempt amounts, is allowed in a control area. For example, a single control area can contain storage of 5 pounds of Class 3 unstable (reactive) material, 50 pounds of Class 2 unstable (reactive) material, 120 gallons of Class II combustible liquid, 5,000 pounds of corrosives, etc. However, Table 3-D provides for a single quantity of combinations of flammable liquids. That is, the exempt quantities of flammable liquids do not include, for example, 60 gallons of Class I-B liquid and 90 gallons of Class I-C liquid. A control area may be an entire building or only a portion of a building. It can be a part of a story, an entire story or even multiple stories.

The occupancy classification of a control area is the same as the occupancy classification of the portion or the building in which the control area is located. There is no special occupancy designation for a control area. For example, a control area in a Group M Occupancy is merely part of the Group M Occupancy.

Given this basic understanding of exempt amounts and control areas, the various options in the code for increasing quantities of hazardous materials in a building are as follows:

1. Buildings are generally allowed to have up to the basic exempt amounts of hazardous materials without restriction with respect to separations or protection. In this case, the entire building is designated as a control area. The boundaries of the control area are the boundaries of the building (i.e., exterior walls, roof and foundation).
2. Using the footnotes to Tables 3-D and 3-E, exempt amounts can generally be increased by adding sprinklers throughout the building or by using cabinets or other code-approved enclosures to protect the hazardous materials.
3. Two other options are available to further increase quantities of hazardous materials in a building.
 - a. Construct the building as required for a Group H Occupancy or
 - b. Provide additional control areas.
4. Assuming additional control areas are used, each additional control area must be separated from all other control areas by one-hour fire-resistive occupancy separations. Up to the exempt amounts of hazardous materials are allowed in each control area.
5. Up to four control areas are allowed in any occupancy except wholesale and retail sales occupancies, which are limited to two control areas.

Storage and use. One other fundamental concept involved in applying the exempt amounts is "situation of material." The exempt amounts in the code are based on three potential situations. These are storage, use-closed and use-open.

Storage is generally considered to include materials which are idle and not immediately available for entering a process.

In use is the quantity that could normally be expected to be involved in a process or that could reasonably be expected to be released or involved in an incident as a result of a process-related emergency.

The difference between use-closed and use-open is basically whether the hazardous material in question is exposed to atmosphere during a process, except that gases are defined as always being in closed systems when used since they would be immediately dispersed (unless immediately consumed) if exposed to atmosphere without some means of containment.

Liquid use, dispensing and mixing rooms. Liquid use, dispensing and mixing rooms are classified as Group H, Division 2 Occupancies. Such rooms are required when the quantity of flammable or combustible liquids in use, dispensing or mixing operations exceeds the quantities allowed in control areas for use-open conditions specified in Table 307.7(1).

Liquid storage rooms. With the exception of being classified as a Group H, Division 3 Occupancy, the requirements for liquid storage rooms are similar to those for liquid use, dispensing and mixing rooms.

Flammable or combustible liquid storage warehouses. The requirements for flammable or combustible liquid storage warehouses are similar to those for liquid storage rooms. However, the storage of other materials is not allowed. Combustible storage with liquid storage is more hazardous than storage of liquids only because the combustible storage can provide a heat source that will ignite the liquids. A liquid storage warehouse is required when the quantities of flammable or combustible liquids stored exceed the quantity limits for liquid storage rooms established by IFC Section 3404.3.8. Quantities of flammable or combustible liquid stored in liquid storage warehouses are not limited. Liquid storage warehouses are required to be separated from all other uses by not less than a four-hour area separation wall due to the risk of a catastrophic fire therein.